IN THE CLAIMS

This listing of Claims will replace all prior versions, and listings, of claims in the application:

Claims 1-2 (Canceled).

Claim 3 (Currently Amended): The process of Claim ~~2~~ 26, wherein the heat supply is ~~preferably~~ effected during one of the two operations (b) and (c).

Claim 4 (Currently Amended): The process of Claim ~~2~~ 26, wherein the solid, in the first reaction zone, is reacted with an agent selected from the group consisting of H_2O, CO_2, and mixtures thereof.

Claim 5 (Currently Amended): The process of Claim 4, wherein the solid, in the first reaction zone, is ~~preferably~~ reacted with H_2O.

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Claim 6 (Currently Amended): The process of Claim ~~2~~ 26, wherein the solid subjected to oxidation in the first reaction zone comprises at least one element ~~characterized by~~ having at least two different oxidation states, stable under the reaction conditions.

Claim 7 (Currently Amended): The process of Claim 6, wherein the solid, in the two different oxidation states ~~situations~~ is further characterized by different amounts of oxygen and enthalpy and is capable of cyclically and continuously passing from the reduced form to the oxidized form, and vice versa.

Claim 8 (Currently Amended): The process of Claim 7, wherein at least one redox element is present in the solid as a binary compound corresponding to the formula

$$Me_xO_y;$$

wherein Me is selected from the group consisting of Ce, Fe, W, and Ni;

or as a compounds corresponding to the formula

$$Me_xZ_zO_y,$$

wherein Me is one or more elements selected from the group consisting of Ce, Pr, Co, Ni, Fe, Mo and W;

Z is one or more elements selected from the group consisting of Ce, Zr, V and Mo;

$x \geq 1$, $y \geq 0$, and $z \geq 1$.

Claim 9 (Currently Amended): The process for Claim 8, wherein Me is ~~equal to~~ Fe.

Claim 10 (Currently Amended): The process of Claim 9, wherein the ~~iron~~ Fe is present in the solid in a quantity ranging from 20 to 60% by weight.

Claim 11 (Currently Amended): The process of Claim 10, wherein the Fe is present in the solid as a binary compound together with ~~the~~ a binary compound of cerium and/or a compounds corresponding to formula (8), wherein Me ~~≠~~is Fe and Z ~~≠~~is Ce.

Claim 12 (Previously Amended): The process of Claim 11, wherein the compound corresponding to formula (8) is $FeFeO_3$.

Claim 13 (Currently Amended): The process of Claim 9, wherein the solid also contains a metal as promoter selected from the group consisting of Pt, Pd, Au and Rh.

Claim 14 (Previously Amended): The process of Claim 13, wherein the promoter is in a percentage ranging from 0.01 to 2% by weight.

Claim 15 (Currently Amended): The process of Claim 9, wherein the solid also contains a transition metal as promoter selected from the group consisting of Cr, Mn, Nb and V.

Claim 16 (Currently Amended): The process of Claim 15, wherein the promoter is in a ~~quantity~~ percentage ranging from 0.1 to 15% by weight.

Claim 17 (Previously Amended): The process of Claim12, wherein chromium is present as promoter.

Claim 18 (Currently Amended): The process of Claim 8, wherein the ~~reactive phase~~ redox element thus obtained can be used as such, or dispersed or supported on compounds ~~including~~ selected from the group consisting of silica, alumina, ~~and other pure~~ oxides ~~including~~ of magnesium, calcium, cerium, zirconium, titanium, lanthanum, and mixtures thereof.

Claim 19 (Currently Amended): The process of Claim 8, wherein the ~~reactive phase~~ redox element is present in a quantity ranging from 20 to 80% by weight with respect to the compound which forms the carrier or the dispersing phase.

Claim 20 (Currently Amended): The process of Claim 26, wherein the reducing stream is selected from the group consisting of hydrocarbons~~, preferably aliphatic~~.

Claim 21 (Currently Amended): The process of Claim 20, wherein the ~~aliphatic~~ hydrocarbon is CH_4.

Claim 22 (Canceled).

Claim 23 (Currently Amended): The process of Claim ~~22~~ 26, wherein the ~~heat supply~~ supplying of heat is obtained using hydrogen as fuel.

Claim 24 (Currently Amended): The process of Claim ~~2~~ 26, wherein the ~~heat supply~~ supplying of heat is obtained using methane or natural gas as fuel.

Claim 25 (Canceled).

Claim 26 (New): A process for the production of hydrogen and carbon dioxide comprising:

a) oxidizing a solid in a first reaction zone to produce hydrogen;

b) passing the oxidized solid to a second reaction zone into which a reducing stream comprising hydrocarbon as reductant is fed and reacting the oxidized solid with the hydrocarbon to produce carbon dioxide;

c) recovering the reducing solid and feeding it to the first reaction zone;

d) wherein heat is supplied as needed by use of a supplementary thermal support unit situated between the two reaction zones.

Claim 27 (New): The process according to Claim 26, comprising:

sending the gaseous phase produced during the reduction of oxidized solid to a separation section which allows the separation of the complete combustion products (CO_2 and H_2O) from any non-converted hydrocarbon;

optionally recycling the gaseous phase to the second reaction zone in which the reduction of the oxide takes place and/or to a further reaction zone, to enable complete conversion of the gaseous phase to provide complete combustion products (CO_2 and H_2O); and

eliminating from the cycle the complete combustion products (CO_2 and H_2O) coming from a purification section.

Claim 28 (New): The process according to Claim 26, wherein the supplying of heat is obtained through the combustion of part of the hydrogen formed or through the combustion of methane, natural gas or other hydrocarbons.

Claim 29 (New): The process according to Claim 26, wherein the heat supply is obtained by exploiting the heat which develops due to further oxidation of the solid with air.

Claim 30 (New): The process according to Claim 26, wherein water is fed (1) to the first reaction zone (R1) and H_2 (2) is produced, methane is fed (3) to the second reaction zone (R2) and the combustion products of the same are obtained: carbon dioxide and water (4), hydrogen or methane (5) and air (6) are co-fed to the supplementary thermal support unit (R3) and H_2O, nitrogen and, when methane is co-fed, carbon dioxide (7), are obtained, the three zones being connected by transport lines which send the reduced solid coming from the

second reaction zone (R2) to the supplementary thermal support unit (R3) (9), the heated solid to the first reaction zone (R1)(8) and the oxidized solid again to the second reaction zone (R2)(10).

Claim 31 (New): The process according to Claim 26, wherein water is fed (1) to the first reaction zone (R1) and H2 (2) is produced, methane is fed (3) to the second reaction zone (R2) and the combustion products of the same are obtained: carbon dioxide and water (4), hydrogen or methane (5) and air (6) are co-fed to the supplementary thermal support unit (R3) and H_2O, nitrogen and, when methane is co-fed, carbon dioxide (7), are obtained, the three zones being connected by transport lines which send the reduced solid coming from the second reaction zone (R2) to the first reaction zone (R1)(10), the oxidized solid to the supplementary thermal support unit (R3) (9), and the heated solid again to the second reaction zone (R2)(8).

Claim 32 (New): The process of Claim 20, wherein the hydrocarbon is aliphatic.

Claim 33 (New): The process of Claim 26, wherein the reducing stream consists essentially of hydrocarbon.